

**PATENT APPLICATION**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q78557

Setsuo MISHIMA, et al.

Appln. No.: 10/715,568

Group Art Unit: 1793

Confirmation No.: 5060

Examiner: Tima Michelle McGuthry Banks

Filed: November 19, 2003

For: MARAGING STEEL AND METHOD OF PRODUCING THE SAME

**SUBMISSION OF EPO CLAIMS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Claims which correspond to claims 13 and 14 have been allowed in the European Patent Office. These are claims 1 and 2.

For the Examiners information a copy of claims 1 and 2 as allowed by the EPO is attached.

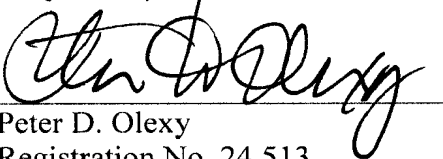
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**23373**

CUSTOMER NUMBER

Respectfully submitted,



Peter D. Olexy  
Registration No. 24,513

Date: March 12, 2008

- 34 -

## CLAIMS

*\* allowed claims  
of a counter-part EP  
application*

1. A maraging steel comprising, by mass percent,  
C : not more than 0.01 %;  
Ni : 8.0 to 22.0 %;  
Co : 5.0 to 20.0 %;  
Mo : 2.0 to 9.0 %;  
Ti : from more than 0 to not more than 2.0 %;  
Al : not more than 1.7 %;  
Mg : more than 0 to less than 10 ppm;  
O : less than 10 ppm;  
N : less than 15 ppm;  
the balance being Fe and incidental  
impurities,

the maraging steel containing nitride  
inclusions having a maximum length of 15  $\mu\text{m}$  and oxide  
inclusions having a maximum length of 20  $\mu\text{m}$ ,

wherein the oxide inclusions comprise spinel-  
form inclusions and alumina inclusions in which the  
content rate of the spinel-form inclusions having a  
length of not less than 10  $\mu\text{m}$  to the total content of  
spinel-form inclusions having a length of not less than  
10  $\mu\text{m}$  and alumina inclusions having a length of not  
less than 10  $\mu\text{m}$  is more than 0.33.

2. A thin strip made from the maraging steel  
defined in claim 1 and having a thickness of not more  
than 0.5 mm.

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## Erhalten

25. JAN. 2008

Strehl et al.

**For any questions about  
this communication:**  
Tel.: +31 (0)70 340 45 00

1997

24.01.08

Reference  
EPA-40812

Application No./Patent No.  
03026532.6 - 1215 / 1422301

Applicant/Proprietor  
**HITACHI METALS, LTD.**

### Decision to grant a European patent pursuant to Article 97(1) EPC

Following examination of European patent application No. 03026532.6 a European patent with the title and the supporting documents indicated in the communication pursuant to Rule 71(3) EPC dated 23.08.07 is hereby granted in respect of the designated Contracting States.

Patent No. : 1422301 /  
Date of filing : 18.11.03  
Priority claimed : 19.11.02/JPA 2002335248  
: 07.02.03/JPA 2003031453

**Designated Contracting States**  
**and Proprietor(s)** : DE FR GB NL  
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Minato-ku,  
Tokyo/JP

This decision will take effect on the date on which the European Patent Bulletin mentions the grant (Art. 97(3) EPC).

The mention of the grant will be published in European Patent Bulletin 08/08 of 20.02.08.

**Examining Division**

**Bombeke M**

Richard M

**Patterson A**



**Registered letter**  
EPO Form 2006A 12.07 18.01.08

to EPO postal service: 18.01.C



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**Europäisches  
Patentamt**

Generaldirektion 2

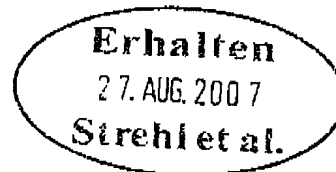
**European  
Patent Office**

Directorate General 2

**Office européen  
des brevets**

Direction Générale 2

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Application No. 03 026 532.6 - 1215	Ref. EPA-40812	Date 23.08.2007
Applicant HITACHI METALS, LTD.		

#### Communication under Rule 51(4) EPC

You are informed that the Examining Division intends to grant a European patent on the basis of the above application with the text and drawings as indicated below:

In the text for the Contracting States:  
 DE FR GB NL ✓

#### Description, Pages

1-3, 8-33 ✓ as originally filed  
 4-7 ✓ received on 03.04.2007 with letter of 03.04.2007

#### Claims, Numbers

1, 2 ✓ received on 03.04.2007 with letter of 03.04.2007

#### Drawings, Sheets

1/5-5/5 ✓ as originally filed

With the following amendments to the above-mentioned documents by the examining division

Description, Pages 12 ✓

A copy of relevant documents is enclosed

*P.f. 27.8.07*

The title of the invention in the three official languages of the European Patent Office, the international patent classification, the designated Contracting States, the registered name of the applicant and the bibliographic data are shown on the attached EPO Form 2056.



Date 23.08.2007

Sheet 2

Application No.: 03 026 532.6

You are requested within a **non-extendable** period of four months of notification of this communication

- |     |  |               |        |
|-----|--|---------------|--------|
| 1.  | to file 1 set of translations of the claim(s) in the two other EPO official languages; |               | EUR    |
| 2a. | to pay the fee for grant including the fee for printing up to and including 35 pages;  | Reference 007 | 750.00 |
| 2b. | to pay the printing fee for the 36th and each additional page;                         |               |        |
|     | number of pages: 4   | Reference 008 | 44.00  |
| 3.  | to pay the additional claim fee(s) (Rule 51(7) EPC);                                   |               |        |
|     | number of claims fees payable:   | Reference 016 | 0.00   |
|     |  | Total amount  | 794.00 |

Concerning the possibility of a request for accelerated grant pursuant to Article 97(6) EPC, reference is made to OJ EPO 2001, 459.

If you do not approve the text intended for grant but wish to request amendments or corrections, the procedure described in Rule 51(5) EPC is to be followed.

If this communication is based upon an auxiliary request, and you reply within the time limit set that you maintain the main or a higher ranking request which is not allowable, the application will be refused (Article 97(1) EPC, see also Legal Advice 1505 (rev. 02), OJ 6/2005, 357).

If the enclosed claims contain amendments proposed by the Examining Division, and you reply within the time limit set that you cannot accept these amendments, refusal of the application under Article 97(1) EPC would result in the case that agreement cannot be reached on the text for grant.

In all cases except those of the previous two paragraphs, if the grant, printing or claims fees are not paid, or the translations not filed, in due time, the European patent application will be deemed to be withdrawn (Rule 51(8) EPC).

For all payments you are requested to use EPO Form 1010 or to refer to the relevant reference number.

After publication, the European patent specification can be downloaded free of charge from the EPO publication server <https://publications.european-patent-office.org> or ordered only from the Vienna sub-office upon payment of a fee (OJ EPO 2005, 126).

Upon request in writing each proprietor will receive the certificate for the European patent **together with one copy** of the patent specification only if the request is filed within the time limit of Rule 51(4) EPC. If such request has been previously filed, it has to be confirmed within the time limit of Rule 51(4) EPC. The requested copy is free of charge. If the request is filed after expiry of the Rule 51(4) EPC time limit, the certificate will be delivered without a copy of the patent specification.

#### Translation of the priority document(s)

If the translation of the priority document(s), as required by Article 88(1) EPC, or the declaration according to Rule 38(5) EPC has not yet been filed, Form 2530 will be despatched separately. The translation is to be filed within the above mentioned time limit (Rule 38(5) EPC).



Date 23.08.2007

Sheet 3

Application No.: 03 026 532.6

Note on payment of renewal fees

If a renewal fee falls due between notification of the present communication and the proposed date of publication of the mention of the grant of the European patent, publication will be effected only after the renewal fee and any additional fee have been paid (Rule 51(9) EPC).

Under Article 86(4) EPC, renewal fees are payable to the European Patent Office until the year in which the mention of the grant of the European patent is published.

Filing of translations in the Contracting States

Pursuant to Article 65(1) EPC the following Contracting States require a translation of the specification of the European patent in their/one of their official language(s) (Rule 51(10) EPC), insofar this specification will not be published in their/one of their official language(s)

- within **three** months of publication of the mention of such decision:

DE GERMANY  
FR FRANCE

GB UNITED KINGDOM  
NL NETHERLANDS

The date on which the European Patent Bulletin publishes the mention of the grant of the European patent will be indicated in the decision on the grant of the European patent (EPO Form 2006).

The translation must be filed with the national Patent Offices of the Contracting or Extension States in accordance with the provisions applying thereto in the State concerned. Further details (e.g. appointment of a national representative or indication of an address for service within the country) are given in the EPO information brochure "National law relating to the EPC", and in the supplementary information published in the Official Journal of the EPO, or available on the EPO website.

Failure to supply such translation to the Contracting and Extension States in time and in accordance with the requirements may result in the patent being deemed to be void ab initio in the State concerned.

Note to users of the automatic debiting procedure

Unless the EPO receives prior instructions to the contrary, the fee(s) will be debited on the last day of the period of payment. For further details see the Arrangements for the automatic debiting procedure (see Supplement to OJ EPO 2, 2002).



Date 23.08.2007

Sheet 4

Application No.: 03 026 532.6

**Examining Division:****Chairman:****2nd Examiner:****1st Examiner:**

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Rischard, Marc

Bombeke, Martin

**VAN DER HOEVEN, M****For the Examining Division**

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**Branch at The Hague****Enclosure(s):**

Form 2056

• 39 Copies of the relevant documents

Europäisches Patentamt  
GD2European Patent Office  
DG2Office européen des brevets  
DG2

## Annex to EPO Form 2004, Communication under Rule 51(4) EPC

## Bibliographical data of European patent application No. 03 026 532.6

For the intended grant of a European patent, the bibliographical data are set out below, for information:

## Title of invention:

- Maraging-Stahl und Verfahren zu dessen Herstellung ✓
- Maraging steel and method of producing the same ✓
- Acier maraging et son procédé d'élaboration ✓

## Classification:

INV. C22B9/20 C22C38/10 C21C7/04

## Date of filing:

18.11.2003 ✓

## Priority claimed:

JP / 19.11.2002 / JPA2002335248 ✓

JP / 07.02.2003 / JPA2003031453 ✓

Contracting States\*  
for which fees have  
been paid:

DE FR GB NL

Extension States\*  
for which fees have  
been paid:

## Applicant(s)\*\*:

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100-8, Yadacho ✓  
Matsue-shi  
Shimane 690-0021  
JPHara, Kenichiro ✓  
291-62, Kawaoka ✓  
Yonago-shi  
Tottori 689-3521  
JPFujita, Etsuo ✓  
1514-5, Hashimacho ✓  
Yasugi-shi  
Shimane 692-0014  
JP

A. 1. 27. 2. 07



Europäisches Patentamt  
GD2

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- \*) In case the time limits pursuant to Article 79(2) and Rule 85a EPC have not yet expired, all **Contracting States/Extension States** have been mentioned.
- \*\*) In case two or more applicants have designated different Contracting States, this is indicated here.

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Printed:23-07-2004

DESC

EP03026532.6

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high, temperature of the surface of molten steel irradiated with a beam under high vacuum is high, selective evaporation of the element occurs, and it is difficult to control components. Moreover, in a vacuum  
5 electro slug remelting process, the effect of Mg addition is obtained in the same manner as in the vacuum arc remelting process, but evaporation phenomenon of Mg is inhibited by ~~sl~~<sup>a</sup>g, and the Mg addition effect is reduced. Therefore, the vacuum arc  
10 remelting process is preferable for the vacuum remelting in the present invention.

When the maraging steel produced by the above-described method is applied to a component for a continuously variable transmission of an automobile  
15 engine, steel is formed into a thin strip having a thickness of not more than 0.5 mm by plastic working such as hot rolling and cold rolling.

By the plastic working performed after the vacuum remelting, the oxide inclusions is crushed or  
20 extended or torn, and can be refined. For example, magnesia generated by Mg addition or a cluster of spinel form inclusions that take place during the vacuum remelting is also segmentized and refined by the hot or cold plastic working.

25 By a combination of the plastic working, the thin strip is especially preferable as a maraging steel thin strip for the component for the continuously variable transmission, which has a high fatigue